

Implementing e-Portfolios: Technical and Organisational Issues

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ABSTRACT

Personal development planning (PDP) is a key issue in relation to professional and career development, and e-portfolios are a tool that can aid in this process. Many benefits of paper-based and online portfolios have been investigated but less has been reported on the technological and organisational issues which impact on user acceptance and uptake. This paper reports on experiences of the Enhancing Learner Progression Project in implementing two different e-portfolio systems in six different personal development contexts. Findings relate to access to the e-portfolio, the need for changes in pedagogy, time constraints for staff using e-portfolios and the future direction and questions raised from using e-portfolios.

Keywords

E-portfolios, personal development, implementation issues, security, technology, organisational issues

INTRODUCTION

One of the strong messages that come from the many papers on e-learning is that *“it’s about people...not technology”* (Dublin, 2004, p294). However, whilst it may be the ideal that the technology sits seamlessly behind the scenes, in reality in the early stages of any new e-learning project the technology will impinge on the learners as well as others involved such as tutors, supervisors, trainers, managers and IT staff. Similarly organisational issues can impact on the technology solutions available, for example managing risk to maintain system security to ensure reliability and quality of service. It is from these experiences that we learn how to implement and use technology more effectively and seamlessly to meet the particular needs of our organisations.

This paper reports on the initial experiences of those involved in the implementation of two electronic portfolio systems designed for learners in six different cases located in schools, colleges, universities and work-based learning. The report highlights issues that can impinge on the implementation of e-portfolios from technological, pedagogical and organisational perspectives, impacting on uptake and use. Although users can be resilient and willing to put up with a degree of technical hitches and obstacles, these do not inspire user confidence or encourage reluctant users to engage with these systems. Technology can also require a change in the way that tutors work in order for the benefits offered by the technology to be fully realised, for example the increased ease of recording and sharing evidence which can be repurposed for multiple uses and audiences (Greenberg, 2004).

Contexts and Case Studies

This study forms part of the Enhancing Learner Progression project, funded by the JISC Distributed e-Learning Programme (www.jisc.ac.uk/index.cfm?name=bradfordelp&src=alpha), which is exploring the application of e-portfolios at key transition stages in the Student Lifecycle (Bradford, 2004) shown in Figure 1 below.

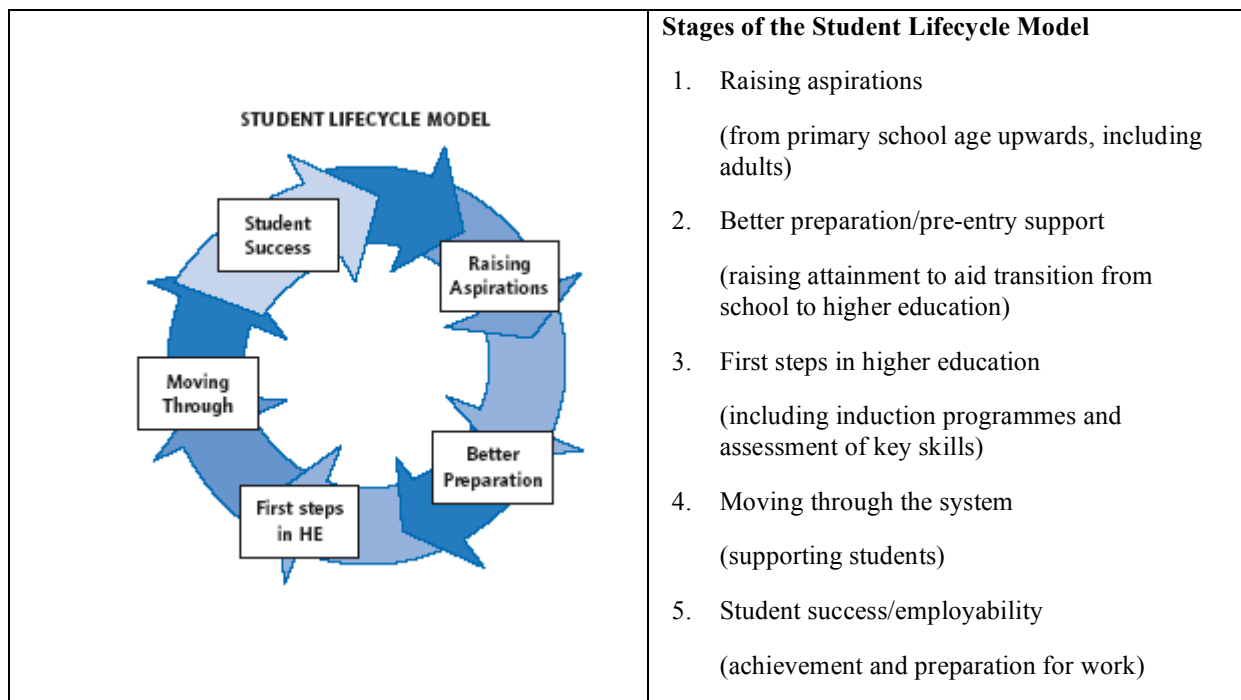


Figure 1: The Student Lifecycle Model

The three partner institutions (Leeds, Bradford and Leeds Metropolitan Universities) used two different e-portfolio systems to support learners at different stages in their progression through the lifecycle. The University of Leeds used Bodington VLE tools and The Universities of Bradford and Leeds Metropolitan used the PebblePad e-portfolio (<http://www.pebblelearning.co.uk/>). In total, six case studies of use were implemented:

1. Sixth form school students in Bradford for progression into Higher Education (PebblePad)
2. Further Education (FE) college students in West Yorkshire for progression into Higher Education, adapting an existing paper-based portfolio to an e-portfolio (PebblePad).
3. FE college students in West Yorkshire who have aspirations to apply to highly competitive health related undergraduate courses (Bodington).
4. Undergraduate and postgraduate nursing students for professional development (Bodington).
5. Pre-Registration House Officers (PRHOs) for professional development (Bodington)
6. Undergraduate clinical science students aiming to transfer to a medical degree (PebblePad).

Each instance of use had different requirements of the e-portfolio but the issues that arose are broadly similar across both systems and all cases.

BACKGROUND LITERATURE

Portfolios have been increasingly advocated for professional development in the medical professions (Challis, 1999 and Joyce, 2005) and e-portfolios are increasingly being used in secondary and tertiary level education (Beetham, 2005, Richardson & Ward, 2005). Portfolios are seen as an authentic form of assessment (Hill & Irving, 2003) and one which encourages reflection (Mathers et al, 1999). However, some argue that portfolios do not always promote reflection and can actually hinder the reflective process (Pearson & Heywood, 2004).

Many would go on to add that with the advent of digital technologies we can enhance the portfolio even further. The technology allows for greater flexibility and multipurpose use of material (Greenberg, 2004). E-portfolios can be multimedia in nature allowing for different learning styles to be catered for and leading to much greater audience interactivity (Woodwood & Nanlohy, 2004). The digital nature can help student presentation (Clegg et. al. 2005) and the communication tools available can support “*ongoing interactions with mentors, colleagues and friends*” (Greenberg, 2004:29).

For all the purported student learning benefits of e-portfolios, the reality of implementation can be a challenge. We must be careful that the technology does not overshadow or subsume the learning benefits of portfolios (Woodwood & Nanlohy, 2004). The technology should be used to support learning through the portfolio process and not drive it (Hartnell-Young & Morriss, 1999). The technology can be a barrier for those who believe that their IT skills are not good enough (Woodwood & Nanlohy, 2004). It also relies on the competence of those who will be delivering the e-portfolio (Uhomoihi, 2006) and staff need time to gain these competencies and to learn new ways of working with the technology, something that seems to be in short supply (Devlin, 2006 and Stiles, 2005).

Finally, Clegg et al (2005) raise an interesting discussion point when they talk about 'affordance' in relation to technology. They observe that with most technologies, users generally do not use all the features available to them. Instead they perceive "*only those parts that act as affordances rather than the full range of functionalities that go unnoticed*" (ibid, p6).

EVALUATION METHODOLOGY

The project is an evaluation project which is using a case study approach (Yin, 2003). With six different case studies and two different e-portfolio systems the project has begun to compare the emerging issues across all cases and see if certain findings are specific to a particular instance or whether they seem to be more general issues in implementing e-portfolios. This paper takes a qualitative approach and offers a "*thick description*" (Gomm, et al, 2000, p8) of the project and the stakeholder experience.

Informal and formal interviews have taken place with school and college tutors responsible for delivery of the e-portfolio module. These followed both a semi-structured approach in some cases and unstructured discussions in others. These interviews were carried out face-to-face and via email.

The project team is also maintaining a log, in the form of a weblog, to record all issues encountered during the project.

The population included in the research are:

- Twelve tutors from nine school sixth forms / FE colleges (Cases 1, 2 and 3).
- 85 out of 188 school sixth form / FE college students (Case 1, 2 and 3)
- Three senior college / school managers (Case 1, 2 and 3).
- Four out of 10 nursing students (Case 4)
- Two nursing supervisors (Case 4)
- Six out of 39 PRHO's (Case 5)
- One PRHO supervisor (Case 5)
- Two out of 18 volunteer clinical science students (Case 6)
- Seven project team members who are staff in the partner Universities (all Cases).

It should be noted that all the school / college staff were self-selecting and were comfortable with IT.

FINDINGS / DISCUSSION

Increasingly, e-learning is being delivered via the Internet (Roffe, 2002) because it allows for anytime, anywhere delivery. Uhomoihi (2006:6) notes that "*the implementation of e-learning relies on teacher competence, computer provision and access*". Access can be defined to mean access to the physical technology (ie the computer) and to the relevant learning tools (i.e. the application software).

Both e-portfolio systems used are accessed via the Internet and require usernames and passwords that allow access to an individual's portfolio space via their web browser. Different issues arise depending on the type of access and four key issues are beginning to emerge from our experiences:

- Access to networked computers (internet and web),
- Authentication of users,

- Access to application software,
- What happens to user data in the long-term?

Access to networked computers

Case 1, 2 and 3

Although secondary schools and FE colleges in the UK have invested a considerable amount of money in purchasing computers and installing local area networks. All student groups in these cases had access to computers at some point during timetabled curriculum sessions as well as having access during breaks, lunchtimes and free periods. Many students also had access to networked computers at home. None of the respondents from schools or colleges expressed a concern about a lack of access to networked computers to compile their e-portfolios.

However, networks in schools and colleges have more restrictions placed on access than those at Universities included restricted access to email and internet resources. Security features such as caching, proxy servers, firewall and reduced access to some PC networking and configuration facilities are put in place to prevent underage learners gaining unsupervised access to potentially harmful resources.

This can have unexpected results to the use of internet based e-learning. Two FE colleges using the Bodington VLE (case 3) experienced problems at the beginning of the project due to the use of a local cache. When more than one user logged in to a computer on the network, they were able to view what other users had written to their e-portfolio accounts. The impact of the technical problems encountered was that students became very wary of using the software, which had not been at fault, and did not use the e-portfolio. As one tutor put it "*the initial training was not successful because of the technical issue and the students lost interest*". No additional training or help was able to persuade them to take part. It required action by the local IT support staff to resolve, despite prior discussions regarding system requirements. It was possible to put in a technical solution in place in the Bodington e-portfolio that could override some of these local security systems, but it is unclear where the responsibility should lie and also raises ethical issues about external system altering security features of organisational local area networks.

Cases 4 and 5

Physical access to networked computers is an issue for doctors and nurses working in hospitals. The PRHOs (case 4) have to stay on after their shifts or arrive at work early to be able to access a computer. One PRHO supervisor noted that "*it is difficult to find a mutually convenient time in front of a computer*" (personal communication, email) so that the supervisor and PRHO can discuss the reflections. This compounds any technical hitches that arise.

The e-portfolios themselves were perceived as easy to use by the majority of participants. Participants in Cases 1 and 2 who were using PebblePad were surveyed at an early stage in using the e-portfolio - of the 79 respondents, 62 (78%) had used the e-portfolio five times or less at the time they were surveyed. Fifty percent (40) of these respondents reported that the e-portfolio was 'easy' or 'very easy' to use, and 38% reported it as neither easy nor hard to use. All seven participants who have responded to a similar survey in Case 3 reported the e-portfolio (Bodington) as very easy to use but they all reported prior experience of using an e-portfolio.

Case 6

These undergraduate students based at one of the partner Universities had access to networked computers on campus. However, the module tutor did not engage with the e-portfolio and the 18 participants were volunteers. Consequently, the students did not have access to networked computers in timetabled sessions for this module, although they did have free access to networked computers on campus.

Access summary

Networks in schools and colleges have more restrictions placed on access than those at Universities. This can have unexpected results to the use of internet based e-learning. The impact of the technical problems encountered in Case 3 was that that students did not use the e-portfolio and dropped out of the pilot, since we were unable to address their concerns or restore their confidence in the system privacy and security. This and other similar problems have raised the issue of who needs to take responsibility for ensuring access: the system provider or the providers of the network access? The lack of time-tabled access to networked computers made it

more inconvenient for the students to take part, since they had to organise their own time and access and required more time and effort on their part.

Authentication

Both e-portfolio systems are accessed via the Internet and require usernames and passwords that allow access to an individual's portfolio space via their web browser. Users also normally require user names and passwords to gain access to the networked computers.

Authentication of users presented both organisational and technical challenges at the partner organisations. At one partner institution it was suggested that the participants (case 1) could have access to networked computers when they attended workshops and seminars which are regularly held on campus as part of the access programme. These 'students' are registered in the University student management information system (MIS) and according to the organisational rules, should therefore have university valid usernames and passwords. However, because the University network is not restricted in anyway it was felt that it would not be advisable to allow this category of student access to University computer facilities since we could not guarantee that they would be supervised at all times so user accounts were not created for them. At the other two partner universities (cases 2 and 3), institutional procedures were bypassed and special user accounts were created for participants on those systems they needed to access. This solution was also adopted for Case 1.

Participants in case 6 were university undergraduates and consequently were able to login into their e-portfolios via the same login as they used for all IT systems at the university. This was enabled by use of Lightweight Data Authentication Protocol (LDAP) between the University and the PebblePad system hosted externally. We had also hoped to use this system to authenticate participants in Case 1, but had to put an alternative, bespoke solution in place. Initial set up of LDAP proved challenging but did not impact on users. However, part way through the project the e-portfolio system was unable to authenticate users due to the installation of a new firewall at the partner University. Even though all parties concerned were aware of the potential issues involved, students could not access PebblePad for eight days. At this stage users had already engaged with the portfolio and had spent time and effort (active use by students for three weeks) compiling their portfolios. Students were still able to save work in various electronic formats for later uploading into their portfolio. The impact of this technical hitch has been minimal. Although the concern of the tutor, was that repeated technical hitches "*could affect student motivation*" for using the e-portfolio.

Summary

Most educational institutions are moving towards a single sign-on user name and password for all services accessed over the computer network (Jenkins et al, 2005). However this is not usually possible in technology pilots that are not yet integrated into institutional systems. This makes it a greater challenge for participants, particularly those who do not have good ICT skills or confidence, who have to remember more usernames, passwords and web addresses and deal with potentially more technical hitches.

Application Software

Most web-based e-learning tools require the use of additional software for example, web browsers and multimedia plug-in, and may themselves present challenges to unfamiliar users or those with poor ICT skills. We can not assume that users will have the latest versions of these applications, or indeed have them at all; or that they have the skills to use and navigate round a new learning tool without considerable effort. This third party software has the potential to impact heavily on the users' experience of e-learning. Four such issues were highlighted:

- Availability of application software
- Obtaining the necessary software
- Compatibility of software platforms
- Training and support of users

Availability of application software

The PebblePad e-portfolio was written using Flash which requires that users have the appropriate Macromedia Flash plug-in for their web browser software. Earlier versions of Flash would not allow the e-portfolio to work. IT staff, school and college tutors and the project team experienced difficulty making sure all computers that

would be used by students had the latest version of the plug-in available. There was no consistency across institutions or even within institutions: it would work on some computers and not on others. As noted above, the majority of respondents to the online surveys in cases 1 to 3 reported that the e-portfolios were easy or very easy to use. So this appears not to have impacted on participants in their institutions but it does present problems for users on their home computers, which is the second issue.

Obtaining the necessary software

While users of institutional computing facilities can get help in obtaining required 'access software' eg browsers and plugins, home users are not in such a fortunate position. One sixth form student (case 1) has been prevented from using the e-portfolio at home because he has been unable to download the required software and is restricted to accessing the e-portfolio while at school.

Compatibility of software platforms

The third issue is compatibility of software platforms. Although the e-portfolio was tested on a number of web browsers, it seems that initial frustrations with the single e-portfolio user using Safari resulted in that user giving up the use of the e-portfolio and going back to a paper based system. He did not feel that the hassle of these technical hitches compensated for the benefits offered by the e-portfolio.

Training and support of users

As already noted, the biggest difficulty from a user perspective is the technology itself (Woodwood & Nanlohy, 2004) and users generally do not use all the features available to them (Clegg et al, 2005). This was supported by feedback from one of the local system administrators (case 5) and one participant (case 5). The PHRO administrator noted in his response to an online survey that he had experienced "*difficulties in navigating the e-portfolio*" and "*trying to help non IT friendly supervisors to gain access to and navigate the system*". The participant noted in relation to the system that "*it is so new that no-one seems to be aware of what is really expected in each section – it is all so open ended – direction/guidance would be helpful*".

Summary

Users appear to need help and support in obtaining, integrating and using the various applications that they need to use to access the e-portfolio systems. This technical support to understand the institutional facilities available and how to get these changed to include the applications needed; a technical support system to help users who want to access the e-portfolios from home; and appropriate training for users to help them make the most effective and efficient use of the application software.

What happens to user data in the long-term?

Data in both e-portfolio systems is stored remotely online. The user does not store all of their e-portfolio data, except in the case of when a user uploads a pre-existing file into the e-portfolio. What happens to this data in the long term? E-portfolio development is moving towards the goal of thin portfolios that have a single user interface that then draws on a number of different stores of data that a user has used and built up over a period of time. However, this area is still at an early stage of development (Richardson & Ward, 2005). There are a number of initiatives and consultations underway at the time of writing for example by the Joint Information Systems Committee (<http://www.jisc.ac.uk>), The Higher Education Academy (<http://www.heacademy.ac.uk/>), the Centre for Recording Achievement (<http://www.recordingachievement.org>) and the Centre for Educational Technology Interoperability Standards (CETIS, <http://www.cetis.ac.uk/>). Currently, the most viable solution appears to be that the user exports the data from of their e-portfolio and stores it themselves, assuming the software supports this functionality.

Other Issues

Additional issues that our study has identified have pedagogical and organisational implications. These are use of multiple portfolios, pedagogy and time pressures.

Multiple portfolios

One issue already raised is that users are likely to experience more than one type of e-portfolio system throughout their lifelong learning journey. It also means that tutors are also likely to work with more than one type of e-portfolio. Indeed one member of the project Steering Group (SG) from an FE college noted that

students and tutors at their institution could be involved in a variety of access initiatives with different Universities, all of which could be using different e-portfolio systems (SG meeting, Sept 2005).

So, what implications could this have? Only 5% (4 students) of school / college students (case 1 and 2) on the project have so far had prior experience of using an e-portfolio but with exam boards such as OCR piloting the use of e-portfolios for assessment this percentage is likely to increase. One out of the twelve school / college tutors (cases 1, 2 and 3) have used e-portfolios in teaching before this project; and neither of the two nurse supervisors (case 4) or the two PRHO supervisors (case 5) who completed the online survey had previous experience of using an e-portfolio.

Of the students in cases 1 and 2 who had used an e-portfolio before, two found the current e-portfolio very easy to use and two found the e-portfolio neither easy nor hard to use, whereas none the students in case 3 who responded to the survey had previously used an e-portfolio and reported the Bodington e-portfolio easy to use. As noted above 50% of the respondents in cases 1 and 2 reported the PebblePad portfolio 'easy' or 'very easy' to use. This suggests that students may be reasonably flexible in being able to adapt to different e-portfolios but we will not know this for certain until e-portfolio use becomes much more widespread.

There are also issues that arise in relation to the pedagogical implications of e-portfolios for tutors. The one tutor with prior experience of e-portfolios (case 2) has found it difficult to adapt his previous pedagogy. The tutor has a preference for the previously used e-portfolio and is resistant to change and adapt to what the tutor views as an inferior e-portfolio. The tutor's preference for the previous e-portfolio stems from the differing nature of the e-portfolios. The tool used before is more of an assessment portfolio. It allows for specific student tasks to be logged and tracked and sends email notification. PebblePad, on the other hand, is a lifelong learning portfolio not solely designed for assessment purposes. Tracking students work is done in a different way. The interface is also very different. PebblePad has a single, non-changeable interface which is icon driven. The other e-portfolio looks like a webpage that can be changed and is very text based with highlighted text as hyperlinks. This is an issue that needs to be considered in the design and training of staff using e-portfolios.

Pedagogy

The objectives of a portfolio can be clear and guidance can be provided in how to best to use it but ultimately for tutors and supervisors it is up to them how they integrate it into their work with students. The project has highlighted the fact that not all pedagogical implications can be anticipated before hand. All the school/ college based tutors (cases 1, 2 and 3) have had to adapt and learn how best to use the e-portfolio with their students in a way that suits their own styles and working practices. As an example, all tutors have been keen to monitor student progress and provide formative feedback. The e-portfolio software provides a mechanism to facilitate this; however, that mechanism has not suited all the tutors preferred teaching styles or approaches.

Of the six tutors in cases 1 and 2, four have actively used the facility in the PebblePad e-portfolio. One of the four tutors has abandoned it and is providing feedback verbally during teaching sessions by reading the students work on the screen. This tutor had used a previous e-portfolio system. This is similar to how the two non-using tutors are providing feedback. The three tutors who are still providing feedback electronically are all doing it in a slightly different way. Two tutors are using the 'share and comment' facility in the software however one of them is using the facility but with the addition of a paper register to keep track of work she has commented on. The third tutor is using the publish facility in the software. He has asked students to publish a webfolio and add to it as an ongoing process. He then checks the webfolios periodically for additions and adds any comments as required. What we have is different tutors all using one aspect of the e-portfolio in different ways and in some cases using more traditional methods to complement the electronic method. As designers and implementers we can not always anticipate how tutors will use the e-portfolio.

Time pressure

One factor that gets mentioned frequently in the literature is the time pressures on staff when new e-learning solutions are introduced. A lack of time can affect tutors' abilities to think about their pedagogy and use the e-portfolio successfully. Stiles (2005, p18) notes that time pressure was "*a major factor*" in e-learning implementation. Devlin (2006) found that 85% of respondents in a FE college in Northern Ireland cited lack of time to experiment and apply their learning when introduced to e-learning solutions. This view is also reflected by the project. Two of the tutors have said that it has led to a marked increase in their workload and they find it difficult to allocate time to work with the e-portfolio. Students have also noted that in some cases they are much better at knowing what the software can do than their tutors, which also suggests a lack of tutor time to learn the details of the software beyond the basic training given.

CONCLUSION

E-portfolios are a relatively new innovation which has not yet matured (Richardson & Ward, 2005) but their use is increasing rapidly across the education sectors (Beetham, 2005) and we do not yet fully understand all the issues. Our preliminary findings suggest that access to an e-portfolio in educational institutions is easier than in hospitals and possibly other similar work-based settings. Access at home can still prove to be a problem particularly access to application software. We have found that technology can be a barrier to use due to organisation and technical problems. Often the technical problems can not be foreseen due to differences between institutions. Time is a key factor for both users and those who are going to aid the students learning. Learners need to have time to record and reflect on their experiences. Tutors need to have time to adapt their pedagogies and explore the potentials of the new tools. So far, few students have used an e-portfolio but that is likely to increase and the possibility of users having multiple portfolios increases leading to the question of what will happen with student data in the long term. We now have a clearer idea of what questions to ask and who to ask.

There are a number of implications for Institutions which need to ensure that:

- Pedagogical e-learning innovations are provided with appropriate, user-friendly technical support and back-up
- Mechanisms are in place to support new technology applications and that these are integrated into the existing systems in a secure and reliable way
- Support systems are put in place to provide technical support to home users
- Time and training need to be provided for staff/ tutors/ supervisors to enable them to support students effectively and make the most effective use of all the 'affordances' offered by the technology
- Institutions need to put an exit strategy in place to enable lifelong learners to extract their portfolio from the software application when they move on to another institution, until such times as the lifelong learning e-portfolio is a reality.

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